(7)

from the Author
with compts.

CONTRIBUTIONS

TO

SURGICAL AND GENERAL PATHOLOGY

BY

JOHN CHIENE, M.D. F.R.C.S.E.

TEACHER OF OPERATIVE SURGERY, MINTO HOUSE;
LATELY SENIOR DEMONSTRATOR OF ANATOMY IN THE UNIVERSITY OF EDINBURGH.

EDINBURGH:
E. & S. LIVINGSTONE, SOUTH BRIDGE.
1870.

Digitized by the Internet Archive
in 2015

https://archive.org/details/b21482123

CONTENTS.

Page

1. Complete Obliteration of the Cœliac and Mesenteric Arteries: the viscera receiving their blood-supply through the extra-peritoneal system of vessels (*Journal of Anatomy and Physiology*, November 1868), ... 5
2. A Case of Oblique and Direct Inguinal Hernia occurring on the same side of the body (*Edinburgh Medical Journal*, March 1869), ... 15
3. Anatomical Description of a Case of Intra-peritoneal Hernia, (*Journal of Anatomy and Physiology*, May 1868), . . 24
4. Case of an Obliterated Right Internal Jugular Vein (*Journal of Anatomy and Physiology*, May 1868), . . . 30
5. Note of a Supernumerary Lobe to the Right Lung (*Journal of Anatomy and Physiology*, November 1869), . . 33
6. Case in which the Innominate Veins opened separately into the right auricle, and in which the intestines were misplaced; with remarks on the development of the parts (*Journal of Anatomy and Physiology*, November 1867), . 35
7. Case of Intestinal Malposition, ... 42

I.

COMPLETE OBLITERATION OF THE CŒLIAC AND MESENTERIC ARTERIES: THE VISCERA RECEIVING THEIR BLOOD-SUPPLY THROUGH THE EXTRA-PERITONEAL SYSTEM OF VESSELS.[1]

THE body of a female, aged sixty-five, which had been injected with lard and vermilion from the femoral artery, was dissected in the Practical Anatomy Rooms of the University of Edinburgh, in the month of May 1868. The cause of death, as stated in the certificate accompanying the body, was paralysis. During the dissection required for displaying the vessels supplying the abdominal viscera it was observed that, although the branches of the cœliac and mesenteric arteries were fully injected, the main trunks were completely obliterated at their origins, the obliteration in each case extending to the first branch.

The ABDOMINAL AORTA was extensively diseased. A large pear-shaped aneurism extended from its bifurcation upwards to the crossing of the left renal vein, in length 4½ inches, in breadth, inferiorly where its transverse diameter was greatest, 2½ inches. The inferior mesenteric artery arose from the lower part of the aneurism. Above the renal vein the aorta was enlarged. Atheromatous plates were scattered here and there throughout its whole extent. The iliac vessels were perfectly healthy.

---

[1] Read at the Oxford Meeting of the British Medical Association. August 1868.

The Cœliac Axis arose in the usual position; it was a fibrous cord for the first half inch of its extent; past that point it was of the normal size, dividing almost immediately into the hepatic, splenic, gastric, and left phrenic arteries; they and their branches were fully injected. The gastro-duodenal branch of the hepatic gave off three large pancreatico-duodenal arteries to the pancreas and duodenum. A well-marked branch from the splenic supplied the splenic flexure of the colon anastomosing with the arterial loop formed by the colica media and colica sinistra. This junction was uninjected. No other anastomosis with the mesenteric system could be found. The left phrenic, equal in size to the radial, ramified in the left half of the diaphragm, there inosculating with branches from the lower intercostals. These inosculations were filled with injection. A plexus of tortuous well-injected arteries, situated on the left side of the aorta above the renal artery, connected the left phrenic and pancreatico-duodenal with the renal and supra-renal arteries. As these anastomosing vessels were filled with injection presumably the blood had entered the cœliac system through them. No other injected communication could be discovered; it is quite possible, however, that such may have existed, escaping notice owing to the fluidity of the injection, due to the very warm weather at the time of the dissection.

Mesenteric Vessels. Both these arteries were obliterated at their origin; their branches were filled with injection from the pelvis through the superior hæmorrhoidal, which equalled in size the femoral at Poupart's ligament. The blood reached the superior mesenteric through the left and middle colic arteries, which were more than double their ordinary size; the ileo-colic and right colic were of normal calibre. The last dorsal artery on the right side gave off opposite the apex of the last rib a branch, equal in size to the anterior temporal, which helped to supply the caput cæcum and the commencement of the large intestine, inosculating with the ileo-colic; this inosculation was not injected. The lumbar arteries were large, inosculating freely with each other, and with the ileo-lumbar and circumflex-ilii arteries. The supra-renal arteries were enlarged, sending branches to the fat around the kidneys. On each side a well-marked artery pierced the capsule of the kidney at the upper part, supplying the fat around the organ. These enlarged vessels communicated freely with the lumbar arteries. The right phrenic was absent, its place being taken by branches from the supra-renal on the same side. The epigastric and circumflex-ilii arteries were increased in size.

The AORTA was carefully removed; it was adherent to the anterior surface of the body of the 4th lumbar vertebra; the pressure of the aneurism had caused absorption of the bone at that point. The walls of the artery were thickened and atheromatous, studded with calcareous plates of various sizes. It was laid open from behind: anteriorly its canal was filled throughout the whole length with laminar clots, evidently of long standing. A channel for the passage of the blood to the iliacs remained patent behind this fibrinous layer, which, in the lower part of the cavity of the aneurism, was nearly an inch in thickness. A careful dissection of the origins of the cœliac axis and mesenteric vessels showed organized clots firmly adherent to the edges of their openings, completely obliterating them. The closure of these arteries was not of recent date.

The superior hæmorrhoidal artery was traced into the pelvis, and its inosculations with the internal iliacs were dissected with care. The presence of a large abscess, filled with fœtid pus, surrounding the lower end of the rectum, and the resulting induration of the tissues around, rendered the dissection difficult. The uterus was fixed, and the rectum adherent to the anterior surface of the sacrum.

The SUPERIOR HÆMORRHOIDAL, as large as the femoral at Poupart's ligament, passed into the pelvis a little to the left of the middle line, and, opposite the 2nd sacral vertebra, divided into two primary branches. 1. The smaller or left division, equal in size to the brachial, coursed down the side of the rectum, and there bifurcated; its anterior branch, anastomosed with a branch from the ischiatic, and with the lateral sacral of the gluteal; while its posterior branch joined a plexus around the rectum, and anastomosed with the middle and inferior hæmorrhoidal arteries. 2. The larger or right division, as large as the axillary, also bifurcated. The anterior branch anastomosed by numerous branches with the right pudic and right middle hæmorrhoidal, forming a dense plexus of tortuous vessels resembling closely an 'aneurism by anastomosis.' This plexus lay to the right side of the rectum, opposite the third sacral vertebra. The arteries forming it were twisted and tortuous, similar to the curling arteries of the gravid uterus. After sending branches to this plexus, it divided into two vessels, which ended in the plexus round the rectum. The posterior branch, a very tortuous vessel, after giving off a branch to each plexus, anastomosed with a large branch from the right pudic. This was the principal channel by which the blood passed from the parietal to the visceral arteries, a direct communication existing between the two systems equal in size to the brachial. The main branches of the right division were connected by a transverse vessel. From this description, and from a reference to the diagram, it will be seen that the blood was conveyed from the internal iliacs to the mesenteric vessels; first, through two large plexuses, one situated round the lower end of the rectum, the other at a higher level and to the right; secondly, by three large anastomosing vessels: the whole forming a dense mass of tortuous arteries closely aggregated together on the posterior aspect and sides of the rectum. I could trace no anastomosis in front of the gut. The remaining branches of the internal iliacs were normal. The viscera were normal.

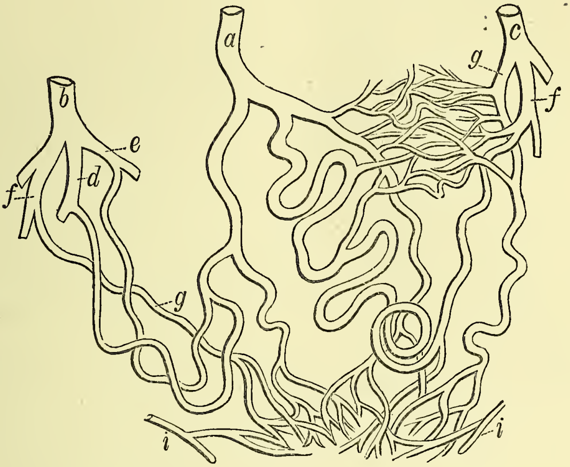


Diagram of Pelvic Plexus, seen from behind, the sacrum having been removed.

a Superior hæmorrhoidal. *b* Left internal ilaic.
c Right internal iliac. *d* Ischiatic *e* Gluteal.
f Pudic. *g* Middle hæmorrhoidal.
i Pudic in perineum, giving off inf. hæmorrhoidal.

Remarks. This case is probably the only recorded example of an obliteration of the three anterior visceral branches of the abdominal aorta at their origin, and of a consequent enlargement of the secondary anastomoses for the supply of the viscera: the stomach, liver, spleen, pancreas, and duodenum being supplied from the left lower intercostals, and from the left renal and supra-renal arteries which inosculated with the lumbar arteries on the same side; the remainder of the intestines receiving its supply from the internal iliacs through a large plexus surrounding the rectum, except the cæcum and ascending colon, which received blood from the last dorsal artery on the right side.

This case presents several interesting practical aspects.

1. It confirms the statement that, between the visceral and parietal branches of the abdominal aorta, a free communication exists through the sub- or extra-peritoneal system of arteries, first systematically described by Prof. Turner in the *Brit. and For. Med. Ch. Rev.* for July 1863.

2. Enlargement of this system of arteries, not only in the abdomen proper but in the pelvis, may take place to such an extent as to become the channel of blood supply to the abdominal viscera when their main arterial trunks are obliterated.

3. It establishes the important practical point that a direct arterial channel exists by which the blood can be drawn directly from the abdominal viscera by the employment of depletory measures to the walls of the abdomen. Thus, in inflammation of the cæcum, the arterial anastomosis between the last dorsal artery and the ileo-colic branch of the superior mesenteric, enlarged in this instance but always present, enables the physician, if he considers it advisable, to draw blood directly from the

inflamed viscus: and in inflammation of the kidneys the anastomoses between the renal and lumbar arteries (specially those branches of the renal which, passing through the substance of the organ, pierce the capsule and supply the surrounding fat), explain easily and satisfactorily why cupping over the loins in inflammation of the kidneys is of such undoubted benefit.

4. It is evident that the anastomoses in the pelvis between the internal iliac and mesenteric vessels, enlarged in this instance for the supply of the viscera, would be one of the principal channels of blood-supply to the lower limbs in occlusion of the lower part of the aorta from disease, or as the result of ligature. Here the current of blood was reversed, the blood flowing from the pelvis to the viscera, while in occlusion of the aorta the blood would pass through the mesenterics into the pelvis, and thence into the internal iliacs to the lower limbs. In ligature of the common iliac, this anastomosis between the mesenterics and internal iliacs would probably be enlarged.

This case is therefore interesting to the surgeon in reference to ligature of the aorta. It does not, I apprehend, bear directly on the important question: Is there any rational hope of recovery after this operation? The arterial changes consequent on disease are gradual, and they therefore do not give us much assistance in estimating the effect that would be produced by the sudden stoppage of the current of blood, as in ligature. It will, however, help to solve the as yet unsettled point—By what channel does the blood reach the pelvis and lower limbs after obliteration of the aorta? That it does so cannot be doubted. There are four cases on record which place this fact beyond dispute. 1. In the *Dublin Hosp. Reports*, II. 1818, Dr Goodisson of Wicklow describes a case in which, as a consequence of disease, the lower part of the aorta and the common iliacs were obliterated. The obliteration was of long standing. The intercostal arteries, and 'in particular that one which takes its course along the last rib,' were 'much increased in size,' the spermatic arteries were 'immensely increased,' the mammary, lumbar, and circumflex ilii were 'much enlarged.' The inferior mesenteric was occluded, but the viscera had been removed before the diseased condition was noticed, so that no description of their arterial supply could be obtained. 2. In a pamphlet on *Aneurism of the Abdominal Aorta*, Ed. 1827, Dr A. Monro relates a case of closure of that vessel at the bifurcation in consequence of an aneurism. The patient died of phthisis, and there were no symptoms referable during life to the abdominal lesion. Dr Monro distinctly says that the cœliac axis, mesenteric, renal and lumbar arteries were of normal size; and adds, that probably the blood reached the limbs by anastomoses between the phrenic, lumbar, ileo-lumbar and circumflex-ilii arteries, between the gluteal and lumbar, and lastly, between the internal mammary and epigastric arteries. In neither of these cases, owing to the vessels being uninjected during the *post mortem* examination, have we a complete or satisfactory account of the enlarged anastomoses which must have been present. 3. The abdominal aorta has been ligatured seven times in man, by Sir Astley Cooper in 1817,[1] by James in 1829,[2] by Murray in 1834,[3] by Monteiro in 1842,[4] by South in 1856,[5] by Stokes of Dublin, March 1869,[6] by Heron Watson of Edinburgh,

---

[1] Cooper and Travers, *Surg. Essays*, i., 1818, p. 101.

[2] *Med. Chir. Trans.* xvi. 1.

[3] *Lond. Med. Gazette*, xiv. 68.

[4] Schmidt's *Jahrbuch*, 1843.

[5] *Lancet*, 1856, p. 222.

[6] *Brit. Med. Journ.*, March 20, 1869.

August 1869.[1] There has not yet been a successful case; but Dr Monteiro's patient lived for ten days after the operation; we may therefore conclude that the blood must have reached and nourished the lower limbs. A *post mortem* examination was made, but special attention does not seem to have been paid to, and no attempt made to discover, the new channels through which the blood reached the extremities. 4. A description will be found in the *Med. Chir Trans.* XXIX., of a case in which Dr William Murray of Newcastle cured, by pressure with a tourniquet on the aorta above the tumour, an abdominal aneurism the size of a large orange. The aneurism was situated below the origin of the superior mesenteric artery, the pulsation being felt on a level with, and a little to the left of, the umbilicus. Two attempts were made, under chloroform—the first for two hours, the second for five; the latter was completely successful. Five months after the operation Dr Murray notes, 'Patient looks well, works as engine-fitter from 6 A.M. to 8 P.M. Lives two miles from his work. No pulsation in the aorta below the tumour, which is now small and hard. Distinct pulsation in right femoral, none in left.' The man is, as far as I am aware, still alive,[2] and the condition of the abdominal vessels cannot be definitely settled; the present case will, I think, aid us in coming to a conclusion. Is it not highly probable that the extra-peritoneal vessels around the kidneys and in the pelvis are enlarged; and that through them the blood is conveyed to the pelvis and lower limbs? This view is strengthened by a note taken on the fourth day after the compression. 'Running over the right border of the tumour a vessel can be felt pulsating, which, from its position and size, is probably the superior mesenteric artery.' Eleven weeks after there is no pulsation to be felt in the iliacs or femorals. Pulsation is not noticed in the right femoral until five months have elapsed. Is not this significant fact explained by supposing that the anastomoses between the lumbar arteries and ascending branches of the gluteal are enlarged; also that the blood having reached the ischiatic and gluteal through the pelvic plexus, is thence poured into the circumflex and perforating branches of the profunda of the femoral; and that the pulsation in the right femoral, five months after the consolidation of the aneurism, is a regurgitant one?

---

[1] *Brit. Med. Journ.*, August 21, 1869.

[2] August 1870. In the *Medical Times and Gazette*, 1870, vol. ii. p. 107, Dr Murray announces the death of this patient. It occurred in June 1870. At the autopsy the aorta was found to be occluded at the seat of the aneurism. There was 'a remarkable development of collateral vessels.' A full account of this important case will be looked for with much interest.

To sum up: these four cases distinctly prove that the circulation can be carried on after the aorta is occluded. In none have we a satisfactory explanation by what channel it reaches the lower limbs. Does not the present case fill up the blank? Can it not now be said that it is through the anastomoses between the parietal and visceral branches of the aorta; in other words, through the extra-peritoneal system of vessels in the region of the kidneys, and more especially in the pelvis, that the blood, for the most part, finds its way to the lower extremities?

II.

A CASE OF OBLIQUE AND DIRECT INGUINAL HERNIA OCCURRING ON THE SAME SIDE OF THE BODY.[1]

THIS combination is worthy of record on account of its rarity. I can find nowhere any detailed description of a similar case.

The body of P. C., a male, æt. 64, was brought into the dissecting-room of the University of Edinburgh in November 1868. A hernia was observed before commencing the dissection of the body. I reduced it with perfect ease, and then expressed the opinion that it was an example of oblique inguinal hernia. The peculiarity of a double sac was not discovered until the abdomen was opened. When this was done, two circular openings with well-defined inferior margins were seen in the right inguinal region. They were of equal size, each measuring 1¼ inch in diameter; a well-marked ridge formed by the deep epigastric artery separated them; another ridge, formed by the obliterated hypogastric artery, bounded the inner opening internally; the external corresponded in position to the internal abdominal ring, the internal to the triangle of Hesselbach. A complete septum separated the sacs into which the openings led; neither sac communicated with the tunica vaginalis testis. The vertical length of the external sac was 2 inches, of the internal 3 inches. Their peritoneal lining was perfectly healthy, and no signs of inflammatory action were present. When I first saw the body, the inner sac was empty; during life both, in all probability, contained intestines. On the left side, two distinct depressions in the same relative positions indicated a tendency to double hernia on that side also.

---

[1] Read before the Medico-Chirurgical Society of Edinburgh, February 1869.

A careful dissection of the coverings were made; this was accomplished without difficulty, only slight adhesions existing at the neck of the outer sac.

Both herniæ passed through the external abdominal ring; in their passage the internal overlapped slightly the external. The ring measured transversely 2 inches, its pillars were strongly marked, from which the *spermatic fascia* passed downwards, forming a covering common to both sacs—*i.e.*, enclosing both in one bag. On reflecting the external oblique, the septum between the herniæ was at once apparent. The *cremasteric fascia* gave a covering to the outer sac, the fasciculi of the cremaster passed down on it for some distance, and then arched up over the neck of the inner sac to become blended with the conjoined tendon at its lower part. On the same level, and continuous with the cremasteric fascia, the inner sac received a well-marked covering from the lower border of the internal oblique, and more internally from the *conjoined tendon.* There was no splitting of the conjoined tendon, it had a distinct lower border seen arching over the neck of the inner sac. The direct hernia must therefore have passed through the lower and external part of the triangle of Hesselbach, where it is uncovered by conjoined tendon. The transversalis muscle was exposed by turning down the internal oblique and cremasteric fascia. Its free lower border arched over both sacs, and gave no covering to either until it reached the inner side of the internal sac, where it joined the tendon of the internal oblique and assisted in forming the covering already described as

Fig. 1.

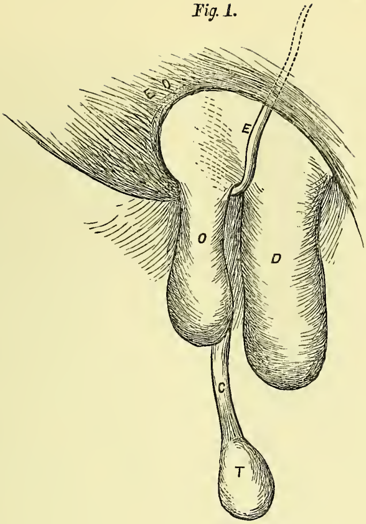
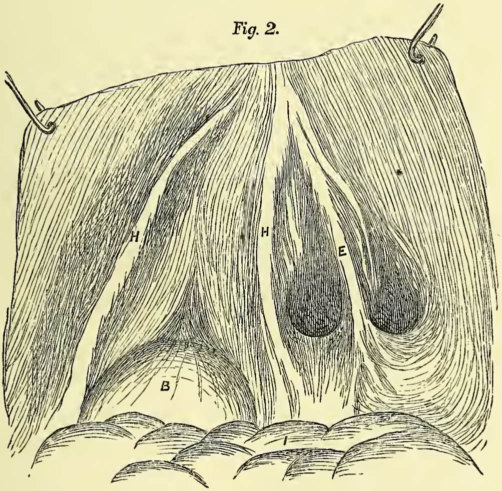


Fig. 2.



DOUBLE HERNIA IN THE RIGHT INGUINAL REGION.

Fig. 1. External view, in which the coverings of the herniæ have been removed, exposing the epigastric artery, and showing the double sac passing out at the external abdominal ring. E O, Tendon of the external oblique muscle; E, Epigastric artery; O, Oblique hernia; D, Direct hernia; C, Cord; T, Testicle.

Fig. 2. Internal view (peritoneal surface), showing the position of the openings into the sacs (from a drawing by Mr Livesay). E, Epigastric artery; H, H, Obliterated hypogastric arteries; B, Bladder; I, Intestines.

The Specimen is preserved in the Anatomical Museum of the University of Edinburgh.

arising from the conjoined tendon. Superiorly, the *fascia transversalis* was one continuous membrane, and passed down giving a separate covering to each sac. The *epigastric artery* was exposed on the reflexion of this fascia. It arose from the external iliac in the usual position, passed forwards between the sacs at the upper part of the septum, then ran upwards and inwards to reach the under surface of the rectus muscle; it was not displaced laterally. The extra-peritoneal fat passed down in a membranous form on both sacs. The *peritoneum*, dipping down on each side of the epigastric artery, formed the double 'sac proper' as already described. The spermatic cord lay behind the oblique hernia; it retained its rounded form.

The following points appear worthy of note:—

1. The commonly accepted description of the course and coverings of the oblique and direct hernia held good in this case.

2. The only covering common to both herniæ as one bag was the spermatic fascia. The evident explanation of this is, that this fascia is precisely the same in both forms of hernia when they occur singly.

3. The septum therefore consisted of six layers. Two formed by peritoneum, two by transversalis fascia, and two by the coverings on a level with the internal oblique (the cremasteric fascia of the oblique and the conjoined tendon of the direct hernia).

4. The only covering that was of necessity double was the 'sac proper,' formed by the peritoneum and extra-peritoneal fat, which both lie on a deeper level than the epigastric artery. The coverings from the transversalis fascia and internal oblique were not necessarily double, and in all probability would each have formed a single bag enclosing both herniæ, if the hernial protusions had descended

simultaneously. We may therefore infer that the herniæ were formed at different periods. We have no means of ascertaining which descended first.

5. Taking into consideration the large size of both sacs, it is highly probable that a diagnosis might have been made during life by one cognisant of the fact that such a peculiarity might exist.

Literature.—Arnaud,[1] Masselin,[2] Brugnone,[3] and Wilmer,[4] record cases of congenital and oblique inguinal herniæ occurring on the same side. In the University Museum there is an example of this variety (No. 768). The description, copied from the catalogue, is—‘ The sac of a double inguinal or scrotal hernia; the one of which was congenital and was operated on, the other was not discovered until after death. That portion of the sac which contained the congenital hernia was situated in front of the other hernia, and was separated from it by the spermatic vessels, which had become flattened out by compression between the inclined coils of intestine.’

Arnaud mentions another class of double herniæ, these he considers a combination of inguinal and femoral hernia. All these authors lived prior to 1806, when Hesselbach[5] first accurately described the anatomy of the inguinal region. He was the first to point out the relation of the neck of the sac to the epigastric artery, classing inguinal herniæ under the two divisions of external and internal.

Surgeons living before his time were not in a position to describe a case similar to the one I now record.

[1] Mémoires de Chirurg., t. ii. p. 603–607.

[2] Richter Chirurg. Bibliothek, t. vii. p. 591.

[3] Dissert de Test. in Fœtu, par. 44.

[4] Pract. Observ. on Hernia, p. 104.

[5] Abhand. Anatom. Chirurg. über den Ursprung der Leistenbrüche.

Scarpa's[1] work on hernia was published in 1809–10. He mentions the combination of congenital and oblique inguinal herniæ, and although acquainted with Hesselbach's division of inguinal herniæ into external and internal, makes no mention of a double hernia consisting of these two forms.

Astley Cooper[2] (1827) relates a case and gives drawings in which six distinct sacs existed, three on each side; but they were all internal to the epigastric artery.

Monro, tertius[3] (1829), says, 'In the same patient we sometimes meet with two, three, or even a greater number of inguinal herniæ, and all of the same kind, or a common inguinal hernia on one side and a ventro-inguinal (direct) on the other.'

Lawrence[4] (1838) says, 'Internal and external inguinal herniæ may co-exist on the same side.'

Bransby Cooper,[5] in Guy's Hospital Reports for 1839, describes a case of double oblique inguinal hernia occurring on the same side of the body.

Chelius[6] (1843) says, 'A double hernial sac is very rare, and indeed possible only in inguinal hernia, where a special sac containing intestines may drive into the vaginal tunic of the testicle when its mouth has remained open.' He here refers to the cases recorded by Arnaud and others.

Teale[7] (1846) quotes Lawrence's statement.

---

[1] Treatise on Hernia, by Antonio Scarpa (trans. by Wishart), p. 90–94.

[2] On Inguinal Hernia, 2d ed., p. 67, plate x.

[3] Morbid Anat. of Gullet, Stomach, and Intestines, 2d ed., p. 137.

[4] On Hernia, 5th ed., p. 237.

[5] Guy's Hosp. Reports, vol. iv. p. 326.

[6] Surgery, South's transl., vol. ii. p. 4.

[7] Teale on Hernia, p. 246.

Birkett, in the article on Hernia in 'Holme's Surgery, makes no mention of double inguinal hernia.

Maclise, in his 'Surgical Anatomy,' gives a drawing of external and internal hernia, but he does not say that he ever met with an example. I apprehend that the drawing is for the purpose of clearly comparing the coverings of the two varieties. In Quain's 'Anatomy' (7th ed., p. 1028), there is a similar drawing.

These are the authorities in which I find any notice of double herniæ. It will be seen that Lawrence is the only one who states that 'external and internal herniæ co-exist on the same side.' He, however, gives no detailed account, only making the general statement. It is probable that, if he had dissected a case himself, he would have given the particulars.

I have gone thus minutely into the literature to show the very great rarity of the combination which I have been fortunate enough to meet with. Its rarity lessens undoubtedly its practical value, but any new facts relating to the important subject of hernia are well worthy of record, even if by so doing the only end gained is that the way is cleared for the more perfect understanding of the next example of a similar nature, should such be met with either at the bedside or on the dissecting-table.

I may here record a second case of *double hernia.*

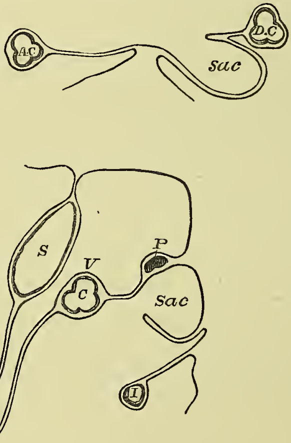
D. C., æt. 84. Died December 1869. He was the subject of: 1. A large *oblique inguinal hernia* on the right side. 2. A *fatty direct hernia* on the same side, the size of a large walnut; it contained a small sac encased in fat, and unconnected with the peritoneal cavity. The corresponding internal surface of the peritoneum was puckered, as if, by closure of the neck of the sac, a spontaneous cure had taken place. (See *Annandale* on *Fatty Hernia*, Ed. Med. Journ., March 1870, p. 769). 3. A *fatty protrusion of the septum crurale*, the size of a walnut, its walls were formed by the femoral sheath; it contained fat and lymphatic glands, and had no connection with the peritoneal cavity. 4. A local fatty deposit in the cord on the left side. 5. A *femoral hernia* on the left side, the size of a small orange; in its coverings fat was abundantly developed.

III.

ANATOMICAL DESCRIPTION OF A CASE OF INTRA-PERITONEAL HERNIA.[1]

This abnormality was noticed in an adult male brought to the Dissecting-Rooms of the University during the present session (1867–68).

When the cavity of the abdomen was laid open, and the great omentum, along with the transverse colon,



Plan of the Peritoneum.

The transverse section is made on a level with the body of the third lumbar vertebra. The observer is supposed to be looking upwards. The vertical section is an antero-posterior one, two inches to the left of the middle line. Sac. Hernial sac. A.C. Ascending colon. D.C. Descending colon. S. Stomach. C. Colon. P. Pancreas. I. Small intestine. V. Lesser cavity of peritoneum above colon.

---

[1] Read before the Medico-Chirurgical Society of Edinburgh. March 1868.

thrown upwards, only a few coils of the lower end of the ileum were visible. On tracing the small intestine upwards, it was found to disappear through an oval opening, measuring $2\frac{1}{4}$ inches by $1\frac{1}{2}$, situated in the anterior surface of the descending mesocolon on a level with, and about 2 inches to the left of the body of the 3d lumbar vertebra. The edge of the opening was free except superiorly and internally where the descending mesocolon was directly continuous with the mesentery of the intestine as it passed into the sac. When the lesser cavity of the peritoneum was laid open by dividing the layers of the great omentum between the stomach and transverse colon, the mesocolon extending upwards and backwards, and enclosing the pancreas, so as to form a peritoneal ligament between it and the posterior abdominal wall, was exposed. When this was divided immediately below the pancreas, a sac of an oval shape, measuring 6 to 8 inches in its longest or vertical diameter, and containing the coils of the jejunum and upper portion of the ileum, was opened into. It lay in the left lumbar region. It was bounded superiorly by the pancreas, anteriorly by the splenic flexure and commencement of the descending mesocolon, posteriorly by the parietal peritoneum which here covered the left kidney and posterior abdominal wall. Its internal surface was smooth and glistening. It was formed by an invagination of the descending mesocolon through the opening already described. No evidence of a rupture of the peritoneum was visible. The intra-hernial bowel lay free, except at a point close to the orifice superiorly and internally where it was attached by its mesentery to the wall of the cavity. The intestine could be drawn entirely out of the cavity through the opening. Seven feet of the ileum were extra-hernial; its mesentery was continuous both on its anterior and posterior aspects with the mesentery of the bowel within the sac. There were no signs of constriction of the bowel at any part. The other viscera and the peritoneum in relation to them were normal. The mesenteric vessels were also normal. The left colic artery wound round the lower margin of the opening from right to left to reach a higher level and anastomose with the middle colic artery.

No history could be obtained of this case, but from the healthy state of the entire gut, and from the absence of any signs of peritonitis, there is no doubt that little or no inconvenience must have arisen from this peculiar arrangement of the intestinal canal. Cases precisely analogous to the one just described, in which the sac is an *invagination* of the peritoneum, are seemingly very rare. Dr Peacock[1] records an example. It occurred in a man, æt. 30, who died of typhus fever in the London Royal Free Hospital, and at the *post mortem* examination a sac, formed by the meso-colon, and containing the jejunum and all the ileum except the lower two inches, was discovered. In other particulars it closely resembled the case I now record. There were no symptoms referable to the abdomen.

Sir Astley Cooper[2] describes the dissection of two forms of intra-abdominal hernia; in one the hernial bowel lay *between* the layers of mesentery, having escaped through an opening in its posterior surface; in another the orifice into the sac was in the meso-colon, the bowel lying *between* its layers, the former he names a 'Mesenteric Hernia,' the latter a 'Mesocolic Hernia.' In neither were any abdominal symptoms noticed. He adds, that probably in both examples a slight torpidity of the bowels may have been present. He cannot say whether they are congenital, or due to a sudden strain or other violence rupturing the peritoneum.

---

[1] *Trans. Path. Soc.*, Lond., vol. ii. p. 60.

[2] *Anatomy and Surgical treatment of Crural and Umbilical Hernia*, p. 73.

Prof. Monro[1] mentions an example in which the bowel escaped through a preternatural opening in the mesentery, strangulation followed by death was the result.

Sir Wm. Lawrence[2] says he has seen two instances of this abnormality—in one the sigmoid flexure, in another the broad ligament of the uterus, formed the sac. I cannot gather from his account whether strangulation was the result of either of these complications.

Dr Peacock (op. cit.) described and showed drawings of another example at the same time that he recorded the case mentioned above. The patient, æt. 27, was admitted into the Edinburgh Royal Infirmary, suffering from all the symptoms of internal strangulation, followed by death after 42 hours' illness. On examination the small intestines were found enclosed in a sac formed *between* the layers of the left mesocolon. The ileum passed out of the sac two inches above its junction with the cæcum, and at that point the canal of the intestine was contracted, the intestinal coats thickened, intensely inflamed and gangrenous.

There is another variety of internal hernia, in which the lesser cavity of the peritoneum forms the sac, the bowel entering it through the foramen of Winslow. Jobert[3] describes a case in which death occurred from strangulation.

Dr John Wilson Moir of Musselburgh has given me notes of another example, which was observed last year in the Hospital at Vienna, at the *post mortem* examination of a patient, who died with symptoms of internal strangulation. On opening the abdomen, the small intestine was invisible; on closer inspection it was found to have passed into the lesser cavity of the peritoneum through the foramen of Winslow.

---

[1] *Observations on Crural Hernia*, 1803, p. 12.

[2] *A Treatise on Ruptures*, 1838, p. 630.

[3] *Traité des Maladies Chirurgicales*, vol. i. p. 522.

Prof. Gruber of St Petersburg[1] also has described cases of internal hernia, and made reference to others.

The Pathology of Intra-abdominal Herniæ is obscure. They may, I think, with advantage be classed under three distinct heads:—

1st. Those in which an invagination of the peritoneum forms the sac. In them the bowel within the sac is *intra-peritoneal.* They are probably congenital malformations, or arise soon after birth, a congenital weakness of the peritoneum forming the mesocolon, or mesentery being the proximate cause; in them I can find no deaths from strangulation. The first of Dr Peacock's cases, and the case which I record, are examples of this class.

2d. Those in which either from congenital malformation, or more probably from rupture of one layer of the peritoneum, an opening is formed through which the bowel escapes from the cavity of the peritoneum, and becomes related to its external surface. They, although intra-abdominal, are *extra-peritoneal.* The view that in the majority of instances the opening is due to rupture from violence or a sudden strain, is favoured by the fact that the peritoneum is a shut sac, and those portions of the peritoneum in which the hernia occurs, are developed as a continuous membrane. Sir Astley Cooper's dissections, Sir William Lawrence's, and the last of Dr Peacock's cases, are instances of this variety.

---

[1] *Canstatt Jahresbericht*, 1862, p. 353. (Since this case was published, Prof. Gruber has written an exhaustive paper on '*Mesocolic Hernia,*' *in Virchow's Archiv.*, 1868. The bibliography of the subject is very fully given).

3d. Those in which the sac is the lesser cavity of the peritoneum, the opening into it being the foramen of Winslow, as in Jobert's and Dr Moir's cases.

IV.

CASE OF AN OBLITERATED RIGHT INTERNAL JUGULAR VEIN.

THIS abnormality occurred in the body of an adult female, dissected in the month of January 1868.

On laying open the carotid sheath on the right side, a fibrous cord-like structure was found immediately external to the carotid artery, which, from its position and connections, was obviously the obliterated internal jugular vein. Below, it joined the subclavian vein behind the right sterno-clavicular articulation, to form the right innominate vein; above, it ended in the right lateral sinus. A surgical probe could be passed from the sinus downwards into the vein for $2\frac{1}{2}$ inches; it could also be passed upwards from the innominate vein for three-fourths of an inch. The intervening portion was impervious. No veins joined it in any part of its extent. The right external jugular was small. There were three large veins in relation to the vertebral artery, one issuing from the foramen in the transverse process of the sixth cervical vertebra, the others from the corresponding foramen in the seventh vertebra; they joined the subclavian vein. The right anterior jugular was large; it received the occipital, temporal, internal maxillary, facial, and superior thyroid veins: it was superficial to the depressors of the larynx, but passed beneath the sterno-mastoid, and, after the internal mammary and transverse cervical veins had joined it, emptied itself into the commencement of the right innominate. A large communicating vein, nearly as large as the little finger connected it, immediately above the sternum, with the anterior jugular of the opposite side. The right superior thyroid vein inosculated freely with the other thyroid veins in the substance and on the surface of the thyroid body. The right inferior thyroid, fully half an inch in diameter, lay over the *centre* of the trachea, in its course to join the left innominate an inch from its termination. The right lateral sinus was normal. The right mastoid foramen was nearly equal in size to the foramen ovale in the sphenoid bone. No peculiarity was noticed in the arteries. The veins on the left side of the head and neck were normal.

The majority of the veins above described were filled with injection, and on opening the right auricle, the foramen ovale was seen to be widely patent, readily admitting the point of the finger. As the arterial system had been injected from the femoral, the injection had passed through this aperture from the arterial to the venous side of the heart, and thence into the veins. The blood must principally have been removed from the cavity of the cranium by the left internal jugular, the anastomosis between the ophthalmic and facial veins, and by the mastoid vein, which had probably joined the occipital vein; but as it had been cut across in reflecting the scalp for the removal of the brain, I cannot speak precisely on this point. The blood from the face and external parts of the head had found its way to the thorax by the anterior jugular, the thyroid plexus of veins, and through free anastomoses with the veins on the left side of the head and neck.

Inflammation of the vein, followed by the formation of a clot, the absorption of that clot, the subsequent obliteration of the vessel, and consequent enlargement of the collateral venous circulation, is a sequence of pathological phenomena to which, in all probability, the appearances found on dissection may be attributed.

The presence of a large superficial transverse vein, and also of a deeper vessel of considerable size, in the *middle line* of the neck, in close contact with the trachea, would, had tracheotomy been required in this individual, have greatly impeded and rendered difficult the proper performance of the operation.

V.

NOTE OF A SUPERNUMERARY LOBE TO THE RIGHT LUNG.

In addition to the constant secondary fissure separating the upper lobe of the right lung from the middle lobe, anatomists occasionally meet with a further, more or less complete, division of the primary lobes of the lung by means of additional branches from the great vertical fissure. This case is however different, in that the abnormal lobe is added to, not formed at the expense of the primary lobes. It occurred in a female, æt. 50, dissected in June 1869.

On raising the right lung, to demonstrate the passage of the pleura from the wall of the chest to the posterior surface of the viscus, a supernumerary lobe, lying between the upper lobe of the lung and the bodies of the dorsal vertebræ, was exposed. It had its origin from the angle formed by the junction of the upper lobe with the root of the lung. It was pear-shaped, 3¼ inches long, 2 inches broad at its widest part, 1 inch at its junction with the mass of the lung. It occupied and completely filled when inflated a cul-de-sac lined with pleura. The length of this sac was 3 inches, the breadth 2 inches. The opening into it admitted two fingers, and was bounded anteriorly, externally, and posteriorly by the vena azygos major, contained in a duplicature of the pleura, and internally by the bodies of the vertebræ; it resembled in size and appearance the foramen of Winslow, the vena azygos, in its relation to the serous membrane, being analogous to the structures between the layers of the lesser omentum. The supernumerary lobe was separated from the upper lobe of the lung by a double fold of the pleural membrane, which descended vertically for 2½ inches from the apex of the thoracic cavity, where it was continuous with the pleura costalis; it enclosed in its free lower border the vena azygos, and formed the outer wall of the cul-de-sac, in which the supernumerary lobe was contained.

In its general arrangement the septum might be compared to the falx cerebri, the vena azygos to the inferior longitudinal sinus, the upper lobe and supernumerary lobe to the hemispheres of the cerebrum. The vena azygos left the wall of the chest opposite the body of the fifth dorsal vertebra, and passed, as already described, in a curved direction round the root of the supernumerary lobe to join the vena cava superior in the usual position: from the free lower border of the septum to the bifurcation of the trachea measured two inches. The left side of the chest was normal; both sides were healthy.

VI.

CASE IN WHICH THE INNOMINATE VEINS OPENED SEPARATELY INTO THE RIGHT AURICLE, AND IN WHICH THE INTESTINES WERE MISPLACED; WITH REMARKS ON THE DEVELOPMENT OF THE PARTS.

A MIDDLE-AGED female subject, dissected last winter (1866–67), in the anatomical-rooms of the University of Edinburgh, exhibited several interesting malformations, a brief account of which may prove instructive.

The right innominate vein, which received the right inferior thyroid, superior intercostal and the greater azygos veins, opened into the upper and back part of the right auricle in the usual position of the superior vena cava. The left innominate vein descended in front of the aortic arch and root of the left lung, disappeared behind the left auricular appendage, ran obliquely across the posterior wall of the left auricle to the auriculo-ventricular groove, and opened into the right auricle to the left of the orifice of the inferior vena cava, at the place where the coronary sinus terminates in a normal heart. There was no valve at its mouth. The vein was joined by the left inferior thyroid vein and left superior intercostal, the latter coming forward immediately above the root of the lung. It increased greatly in size when it reached the heart, where it received the great coronary vein and the middle and posterior cardiac veins, as in the case described by Mr Marshall (*Phil. Trans.* 1850). The two innominate veins were joined together by a slender transverse branch, which crossed obliquely in front of the great arteries opposite their origins from the arch. The Eustachian valve was rudimentary and cribriform. In all particulars this case corresponds to that described and figured by Mr Marshall, but differs, in the absence of a separate coronary opening and in the presence of an imperfect Eustachian valve, from the case described by Prof. Humphry, of Cambridge, in the first number of this Journal. Adopting the explanation given by Mr Marshall, of the mode of origin of these irregularities, we may say that the persistence of the fœtal condition, which this case exemplifies, is due to the imperfect development of the transverse communicating branch between the primitive jugular veins and the consequent non-obliteration of the left duct of Cuvier.

In the abdomen the arrangement of the viscera was as follows:—The stomach was natural. From its pyloric end the duodenum passed upwards into the right hypochondrium, and then, sweeping downwards into the right lumbar region, became continuous with the jejunum without crossing from right to left in front of the aorta. The coils of the small intestine, which was 19 feet long, occupied the right and middle regions of the abdomen; and from the pylorus to the end of the ileum a well marked mesentery connected the small intestine to the posterior wall of the abdomen. The bile-duct opened into the duodenum 3¼ inches from the pylorus. The cæcum was not lodged in the right iliac fossa, but lay loose in the cavity of the abdomen, a meso-cæcum, five inches broad, directly continuous with the mesentery, passed to the surface of the last lumbar vertebra. The colon, twisted on itself and not subdivided into an ascending and a transverse portion, lay to the left of the middle line, and was continuous with the descending colon and sigmoid flexure which occupied their proper regions. A well marked mesocolon was connected to the posterior aspect of the entire length of the colon, so that the latter, like the cæcum, was very mobile. The parietal peritoneum was consequently prolonged continuously over the iliac fasciæ and the anterior surfaces of the kidneys. At the root of the mesocolon the peritoneum was puckered and presented the appearance of a large *cicatrix* both on the upper and under surfaces; but the two peritoneal layers were readily separable, the colic arteries passing between them. The great omentum was prolonged downwards from the lower border of the stomach, its posterior recurrent layers passed backwards to the spine, where they separated, one ascended in front of the pancreas to the diaphragm, the other descended and became continuous with the left (anterior) layer of the mesentery and mesocolon. The parietal peritoneum lining the right lumbar region was continuous with the right (posterior) layer of the mesentery and mesocæcum, whilst the corresponding structure on the left side was continous with the left (anterior) layer. The length of the large intestine was five feet. The superior mesenteric artery arose as usual, descended behind the pancreas and between the layers of the mesentery arching downwards and to the right. From its right or concave aspect ten branches (*vasa intestini tenuis*) arose, which were distributed to the jejunum and ileum. From its left or convex aspect three arteries arose, the lowest (*ileo-colica*) of considerable size, the other two much more slender. The lower of these (*colica dextra*) passed downwards for four inches before it bifurcated to form the usual mesenteric arches; it was distributed to the colon. The upper (*colica media*) 1¾ inch long joined, without bifurcating, the branch (*colica sinistra*) of the inferior mesenteric which supplied the descending colon. The gastro-duodenal artery arose from the superior mesenteric, gave off a branch to the liver, and then divided into the right gastro-epiploic and a large pancreatico-duodenal artery.

The spleen was subdivided into five distinct portions, two were lobulated, and each measured three inches by two; the remaining three were small accessory lobes. This great subdivision of the organ is rare. The other viscera were normal.

With a view to an explanation of the peculiar position of the duodenum in this case, I have examined five human fœtuses from the 12th to the 18th week. In all the stomach had assumed its horizontal position. The duodenum wound round behind the coiled mass of intestine (jejunum and ileum) from right to left, and in all it was connected by a mesentery, more or less distinct, to the spine. In one this mesentery was one-fourth of an inch in breadth (the whole length of the fœtus was four inches), and was directly continuous with the mesentery of the jejunum. In this fœtus the cæcum lay to the left of the middle line. In three specimens the meso-duodenum, although less distintly marked, having apparently become blended with the under surface of the mesentery of the rest of the small intestine, could still be seen connecting the transverse portion of the duodenum to the spine. In these the cæcum had passed to the right of the middle line, but had not yet crossed in front of the duodenum. In these four cases on turning up the jejunum and ileum, which at this period lie closely coiled together in one mass in the middle of the abdominal cavity, the whole of the transverse portion of the duodenum was visible; in the fifth specimen in which the cæcum had passed over the duodenum and come into relation with the parietal peritoneum in the right lumbar region, the duodenum was not visible throughout its entire extent. In all, the parietal peritoneum, after lining the right lumbar region and the right iliac fossa, was continuous with the right side of the descending sigmoid mesocolon.

In the early embryo, as is well known, the intestinal tube is attached to the anterior surface of the spine by a double fold of peritoneum called 'meso-gastrium.' This is one continuous membrane; and the changes which afterwards take place in the position of any portion of the intestines must necessarily affect, more or less, every part of the membrane. That portion of the tube which is to form the stomach turns over on its right side and gradually assumes the horizontal position, its peritoneal fold becomes pendulous, and constitutes the great omentum. The pylorus and duodenum are thus carried to the right of the middle line. The cæcum now takes a position to the left of the middle line in the left lumbar region, and as it travels up, across, and down into the right iliac fossa, drags upon the small intestine and upon its attached mesentery, and, in consequence, a rotation or twisting (to the extent of half a circle, the centre of which is at a point corresponding to the origin of the superior mesenteric artery from the aorta) of the whole gut follows. This appears probable when we take into consideration the continuous nature of the meso-gastrium, the great change in the position of the cæcum, and the limited attachment of the mesentery to the spine. If this opinion as regards the position of the duodenum behind the jejunum and ileum is right, then its fixture there is easily accounted for. The cæcum having passed over the duodenum at the junction of its second and third parts and become related to the parietal peritoneum in the right lumbar region, binds the duodenum down to the spine, as we find it in the normal subject. It then moves down and becomes fixed in the right iliac fossa. The more perfect this attachment is, the less is seen of the duodenum on turning up the intestines. In three cases of moveable cæcum and ascending colon which have lately occurred in the dissecting-rooms a greater extent of the transverse portion of the duodenum than usual could be seen. Whether a twisting of the whole tract takes place or not, the fixed position of the duodenum is undoubtedly dependent on the fact of the cæcum passing over it, and becoming lodged in the right iliac fossa.

In the case which I have described rotation had not taken place. The cicatrix, situated at the root of the mesocolon, and probably due to intra-uterine inflammation, had prevented the large intestine from moving across and down to its normal locality. The duodenum therefore remained free in the abdominal cavity.

The vascular anatomy seems to strengthen this idea. The superior mesenteric artery, instead of running from the mesial line to the right, passed to the left, and gave off the colic arteries from its left side and the arteries to the small intestine from its right, just the reverse of what we usually find. In the usual mode of dissecting this artery (by turning up the omentum and transverse colon and spreading out the small intestine), we remove what was primarily the *right* layer of the meso-gastrium; but in this case when the vessel was dissected, although done in apparently the ordinary way, the membrane removed was the *left* layer. Now, if we suppose a rotation of the intestine to occur, then the artery would assume the normal position.

The cæcum and large intestine having failed to reach their normal position, and an ascending and transverse subdivision not having taken place, the transverse colon had not become permanently blended with the posterior recurrent layers of the great omentum, so that the passage back to the spine of this structure, which represents the meso-gastric fold in the embryo, could be demonstrated as entirely distinct from the transverse mesocolon. This case seems to support the idea, that the arrangement which we find in the normally developed adult, where the recurrent layers of the great omentum are intimately united with the transverse colon and its mesocolon, is of secondary formation and produced by the blending of surfaces originally distinct, a view of the arrangement of the peritoneum which has only lately gained ground in this country, although described by Mr Holden in the first edition of his *Manual of Dissections* (1859). I may here mention that in the fœtuses, from the 12th to the 18th week, which I have examined, the transverse colon was intimately connected with the recurrent layers of the omentum, so that the blending of the transverse colon with the omentum must take place at an earlier period of intra-uterine life.

VII.

CASE OF INTESTINAL MALPOSITION.

Since the foregoing case was published, I have met with an example of intestinal malposition in an adult male, in which the small intestine passed *in front of* the superior mesenteric artery. In this case the first 16 inches of the small intestine lay to the right of the middle line, it then crossed the artery, the remainder lying to the left. The great intestine lay entirely to the right of the middle line. From the right iliac region the colon ran upwards and slightly outwards to the under surface of the liver; it then turned suddenly on itself, passed downwards and forwards until it reached the promontory of the sacrum, when it made a sharp turn, and again ascended into the right hypochondrum; then bending downwards and outwards reached the anterior surface of the right kidney, passed over it, descended in close connection with the posterior abdominal wall, and crossed from right to left in front of the upper part of the sacrum to join the sigmoid flexure. (Diagram A.) The intestinal tube was of the usual length; the position of the sigmoid flexure and rectum was normal.

Spleen. This organ was rudimentary; it consisted of three portions, the largest twice the size of a large bean, the others each the size of a bean. The splenic artery was correspondingly small, it gave off a distinct branch to each splenculus. It is worthy of note that in both these cases of intestinal malposition the spleen was much divided. The other viscera were normal.

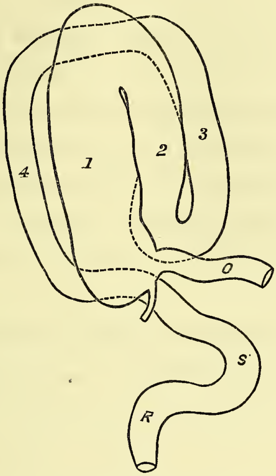


Diagram A, showing arrangement of colon.

O. Ileum. 1, 2, 3, 4, Colon. S. Sigmoid flexure. R. Rectum.

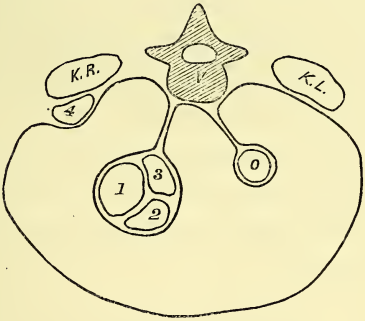


Diagram B.

Transverse section of abdomen through lumbar region, illustrating arrangement of peritoneum. V. Lumbar vertebra. O. Ileum. 1, 2, 3, 4, Colon. K.R. Right kidney. K.L. Left kidney.

Peritoneum. To understand the peritoneal relations, the peculiar arrangement of the great intestine necessitates its division into four parts, marked in diagram A, 1, 2, 3, 4. The cæcum, and the first, second, and third portions of the colon were firmly adherent to each other, and were attached to the right side of the bodies of the lumbar vertebrae by a mesocolon 6 inches wide inferiorly, but which narrowed considerably as it ascended. The cæcum could be moved to any part of the abdominal cavity. The fourth portion of the great intestine was firmly bound down in the right lumbar region by parietal peritoneum. (Diagram B.)

The great omentum was well developed; the posterior layers in their passage back to the spine had no connection with the great intestine; the superior layer passed upwards to form the lesser sac of the peritoneum, the inferior downwards to form the mesentery.

On tracing the mesenteric peritoneum laterally, to the right it was continuous with the anterior layer of the mesocolon, surrounded the 1st, 2d, and 3d portions of the colon, passed back to the spine, then covering the right kidney and binding down the 4th portion of the great intestine, it reached the anterior abdominal wall; to the left the inferior layer of the mesentery passed over the left kidney, lined the iliac fossa, and joined the parietal peritoneum. The foramen of Winslow and the lesser sac of the peritoneum were normal.

Blood-vessels.—The superior mesenteric artery gave off the gastro-duodenal. The ileo-colic, colica dextra, and colica media were rudimentary, and arose from the superior mesenteric artery. In consequence of the malposition of the great intestine, the inferior mesenteric ran from left to right. It gave off the colica sinistra, which anastomosed with the colica media. The anastomoses between the colic arteries lay between the layers of the mesocolon.

The explanation of these peculiarities is, in all probability, as follows:—

(*a*). The upward growth of the cæcum and colon was transferred from the left to the right side of the body; on reaching the liver it was deflected downwards, the curve of the duodenum barring its progress across the abdomen.

(*b*). Its peculiar foldings are accounted for by the necessary increase in length accommodating itself to its abnormal position.

(*c*). There can be little doubt that at one time those portions of the colon marked 1, 2, and 3 in the diagram, were unconnected, and that the mesocolon consisted of six layers. An attack of intra-uterine inflammation had caused a cotemporaneous cohesion of these portions of the intestine and of the layers of the mesocolon.

(*d*). The right side of the abdomen being occupied by the colon, the small intestine took up a position to the left.

In this case, if we make allowance for the length of the intestine, and for the adhesions due to inflammation, we find a very near approach to the primary condition, in which the intestinal tube is joined to the spine by a continuous double fold of peritoneum called the 'meso gastrium.'

We do not find the duodenum in its usual position behind the superior mesenteric artery, because the rotation or twisting of the whole intestine which I have described in the last case, had not taken place.

The development of a mesocolon to those portions of the gut, which usually form the ascending and transverse divisions of the colon, affords further proof that the omentum and transverse mesocolon are at one time separate structures, that, in other words, the transverse mesocolon really consists of four layers, two belonging to the great omentum, two to the mesocolon proper.

CRAWFORD AND M'CABE, PRINTERS, 15 QUEEN STREET, EDINBURGH.